WM-BF25

SERVICE MANUAL

West German Model

Model Name Using Similer Mechanism	WM-31/41
Tape Transport Mechanism Type	MF-WMBF25-04

SPECIFICATIONS

Frequency range	FM: 87.6 - 107 MHz AM: 531-1,602 kHz
Frequency response	40 - 15,000 Hz
Power output	10 mW + 10 mW at DC operation (at 10% harmonic distortion) load impedance 32 ohms
Power requirements	3 V DC Two R6 (size AA) batteries Sony rechargeable battery BP-700 DC IN 3V jack accepts optional Sony AC-D2L AC power adaptor for use on 220 V AC, 50 Hz.
Battery life	Approx. 8 hours on tape playback and approx. 30 hours on FM reception using Sony alkaline batteries AM3 (N)
Dimensions	Approx. 88 × 134 × 31.5 mm (w/h/d) projecting parts and controls
Weight	Approx. 230 g incl. batteries, not incl. other accessories
Accessories supplied	Stereo headphones (open-air type, 1) Battery charger (1)

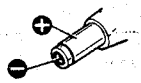
Design and specifications subject to change without notice.

Rechargeable battery (BP-700)	Battery charger (BC-700)	Dolby NR* System
Optional	Optional	provided

Optional Accessories

AC power adaptor AC-D2L
Car battery cord DCC-70
Battery case EBP-500B
Rechargeable battery BP-700
Battery charger BC-700
Stereo active speaker system SRS-30, SRS-50

Note
If an AC power adaptor or a car battery cord not manufactured by Sony is used, a fuse must be installed in the AC power adaptor or the car battery cord and the polarity of the plug must be as illustrated.



Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

MICROFILM

RADIO CASSETTE PLAYER

SONY®

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

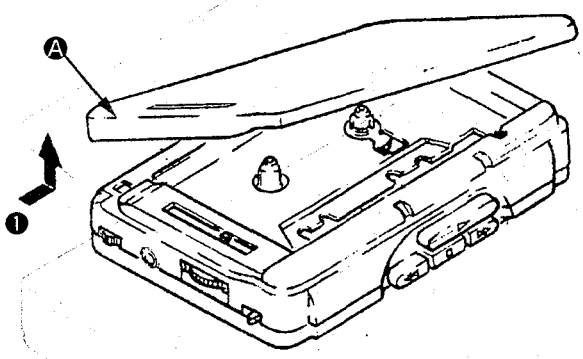
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
DISASSEMBLY AND INSTALLATION

1-1. CASSET HOLDER ASSY REMOVAL

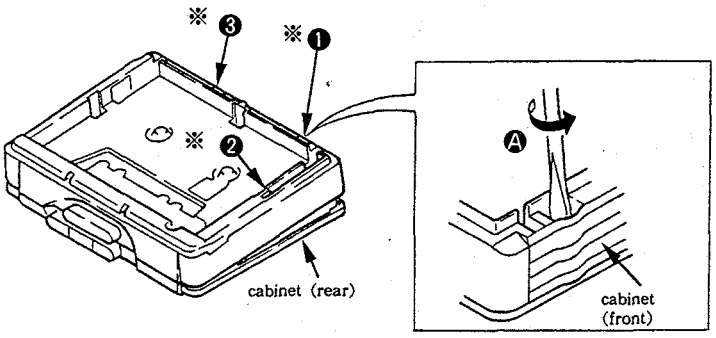
1) Open the cassette holder.
2) Move the left latch in the direction of the arrow ❶ to release it.
3) Release the right latch.
4) Remove the cassette up spring.

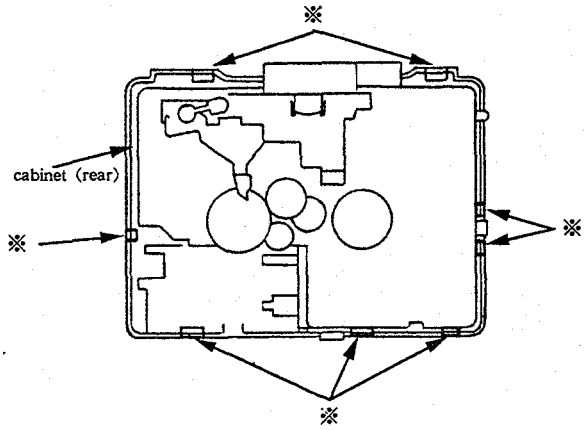


1-2. CABINET (REAR) ASSY REMOVAL

Note :Follow the disassembly procedure the numerical order given.

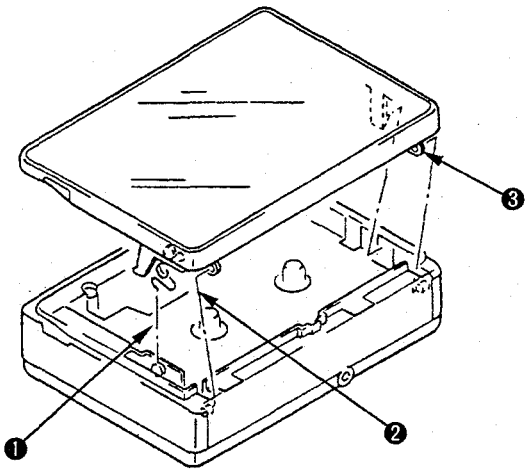
1) Insert a driver (−) in to the portion (※).
2) Move the driver in the direction of the arrow (Ⓐ).
3) Release the claw (※).





1-3. CASSET HOLDER ASSY INSTALLATION

Note :Follow the disassembly procedure the numerical order given.



SECTION 2
MECHANICAL AND ELECTRICAL AJUSTMENTS

MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab :
   playback head　　pinch roller
   capstan　　idlers
   rubber belts
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Meter Reading	Torque Meter
Foward	22-45g · cm (0.31-0.63oz · inch)	CQ-102C
Fast Forwand and Rewind	55-150g · cm (0.77-2.1oz · inch)	CQ-201B
Back Tension	1-2.5g · cm (0.014-0.35oz · inch)	CQ-102C

Tape Tension Measurement

Meter	Meter Reading
CQ-403A	more than 90g (1.26oz)

ELECTRICAL ADJUSTMENTS

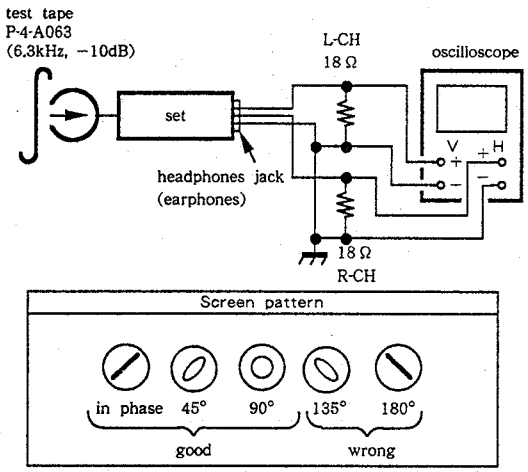
CASSETTE SECTION

Playback Head Phase Check

Note :When replacing the head, check the both L-ch and R-ch phases.

Procedure :

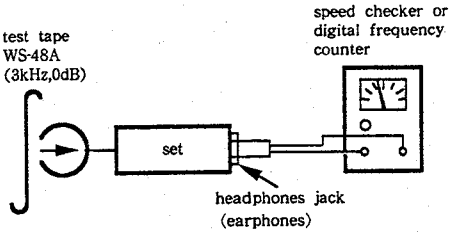
Phase Check
Mode : playback



Tape Speed Adjustment

Procedure :

Mode : playback

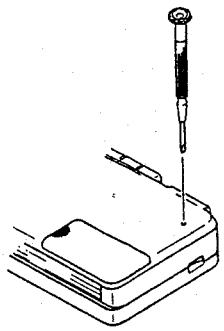


Specification :

speed checker	digital frequency counter
±1%	2,970–3,030Hz

Frequency difference between the beginning and the end of the tape should be within±2.5% (±75%Hz).

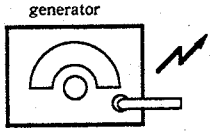
Adjustment Location



ELECTRICAL ADJUSTMENTS

TUNER SECTION

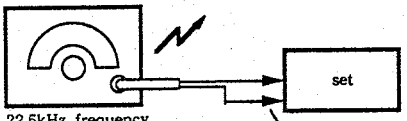
AM rf signal generator



Put the lead-wire antenna close to the set.

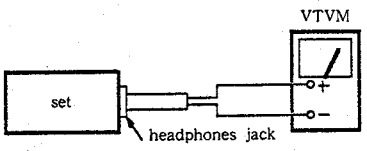
30% amplitude modulation by 400Hz signal
Output lavel : as low as possible

FM rf signal generator



22.5kHz frequency deviation by 1kHz signal
Output level : as low as possible

FM antenna terminal



●Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

FM Frequency Coverage Adjustment

Pointer position	SG frequency	Adjustment part	
f minimum	87.35MHz	L3	maximum
f maximum	107.8MHz	CT3	maximum

FM Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
87.35MHz	L2	maximum
107.8MHz	CT2	maximum

MW Frequency Coverage Adjustment

Pointer position	SG frequency	Adjustment part	Reading on VTVM
f minimum	516.5kHz	L4	maximum
f maximum	1,631.5kHz	CT4	

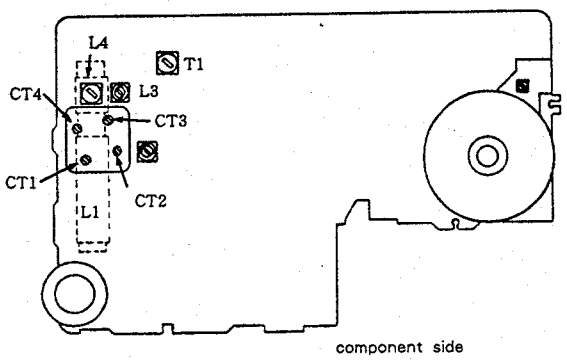
MW Tracking Adjustment

SG and set frequency	Adjustment part	Reading on VTVM
620kHz	L1	maximum
1,400kHz	CT1	

MW IF Alignment

SG and set frequency	Adjustment part	Reading on VTVM
455kHz	T1	maximum

ADJUSTMENT LOCATION



Note :

BAND SW at STEREO.

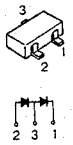
SECTION 3
DIAGRAMS

Note:

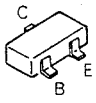
- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ■ : parts mounted on the conductor side.
- ⬚← indicates side identified with part number.
- ⊗ : Through hole.
- ▒ : Pattern on the side which is seen.
- □ : Chip components extracted from the rear side.
- ▒ : Pattern of the rear side.
- ▭ : Printed resistor from the rear side.

Semiconductor Lead Layouts

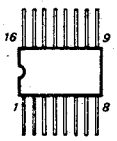
ISS123



2SC1623

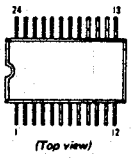


NJM2063AM

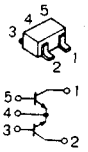


2SC2475

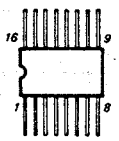
TA8122AF



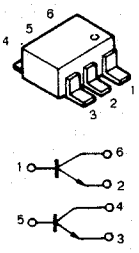
XN1501



LA4570



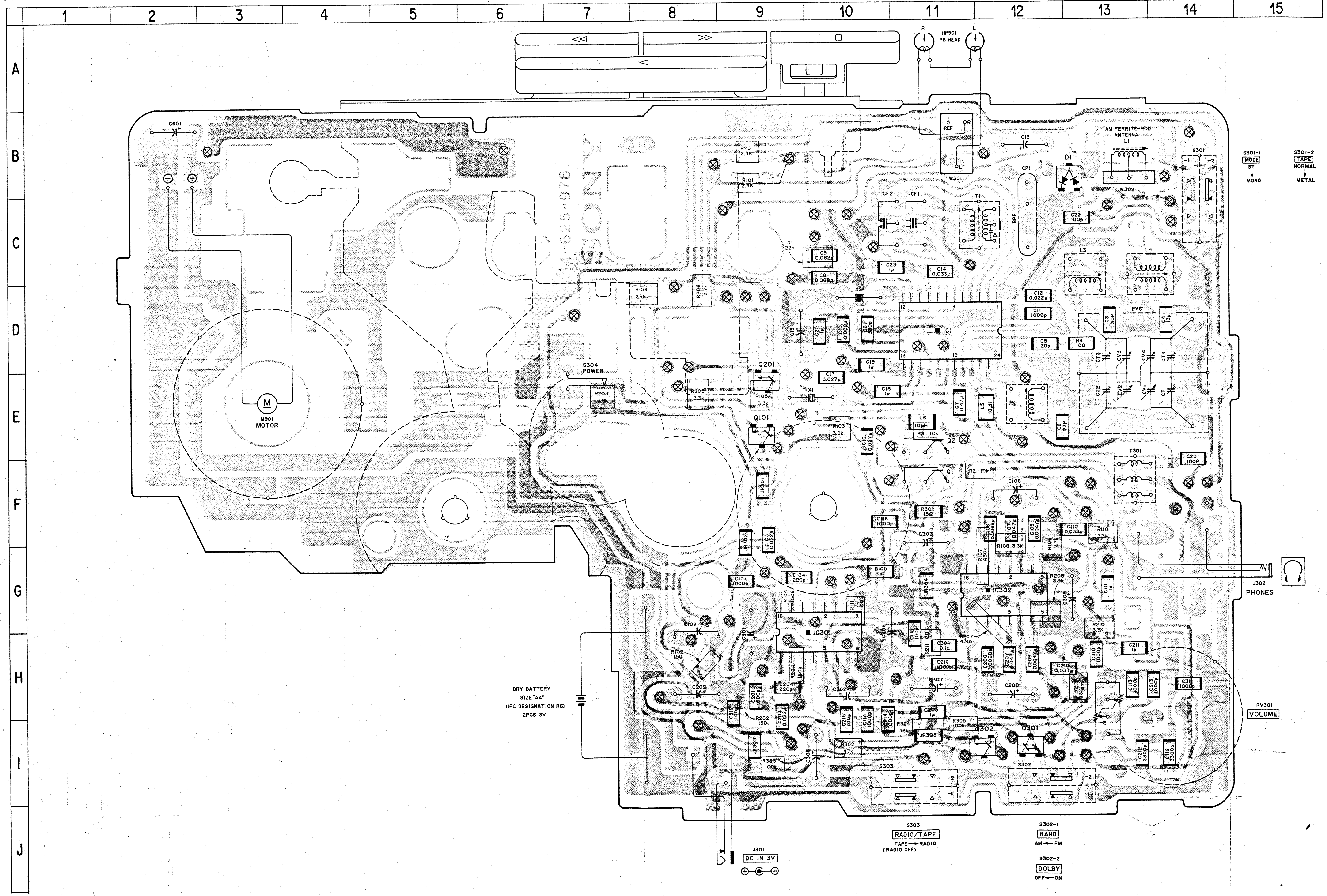
XN6501



Semiconductor Location

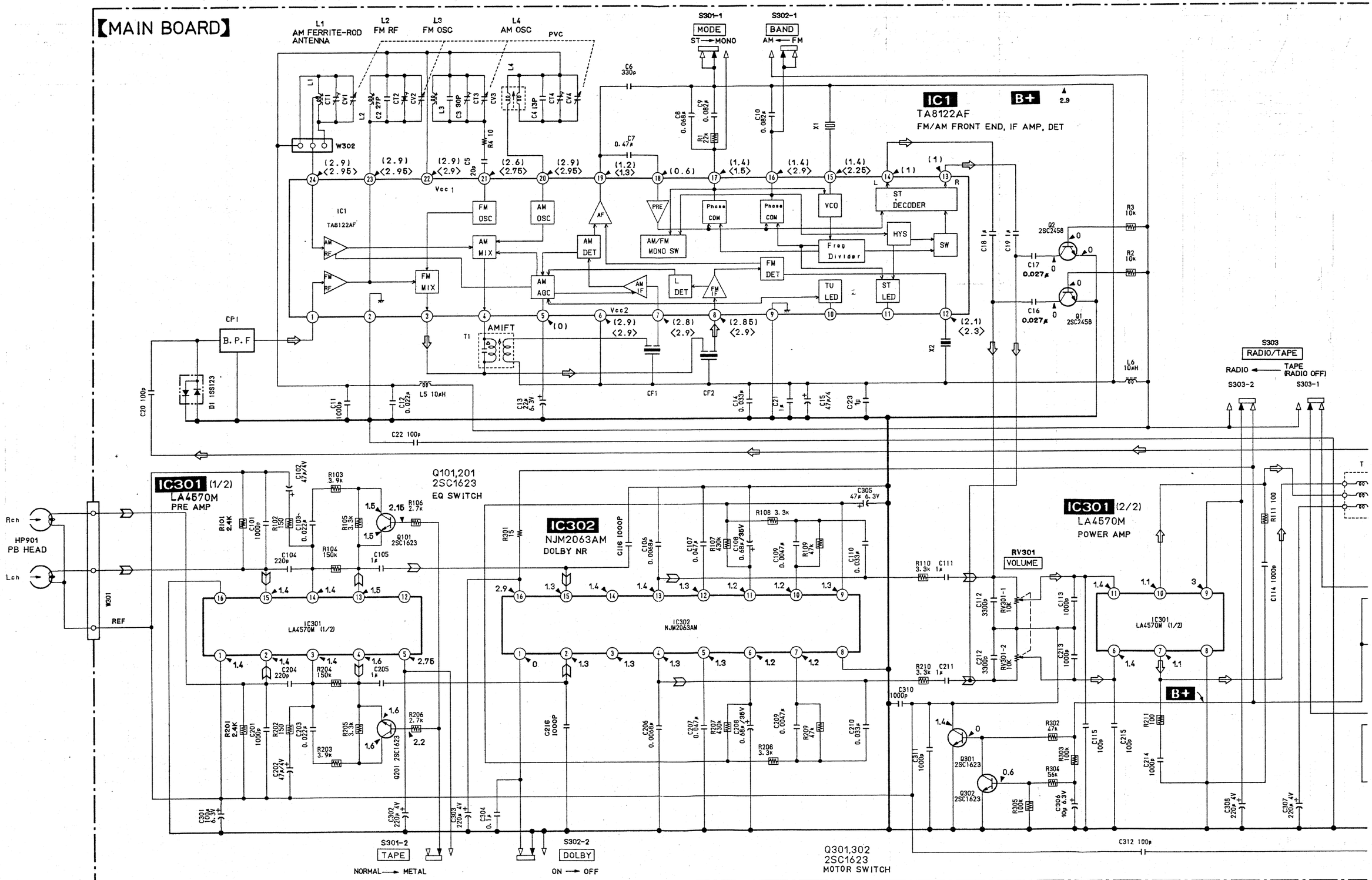
Ref.No	Location
IC1	D−11
IC301	H−9
IC302	G−12
Q1	F−11
Q2	E−11
Q101	E−9
Q201	E−9
Q301	I−12
Q302	I−11
D1	B−12

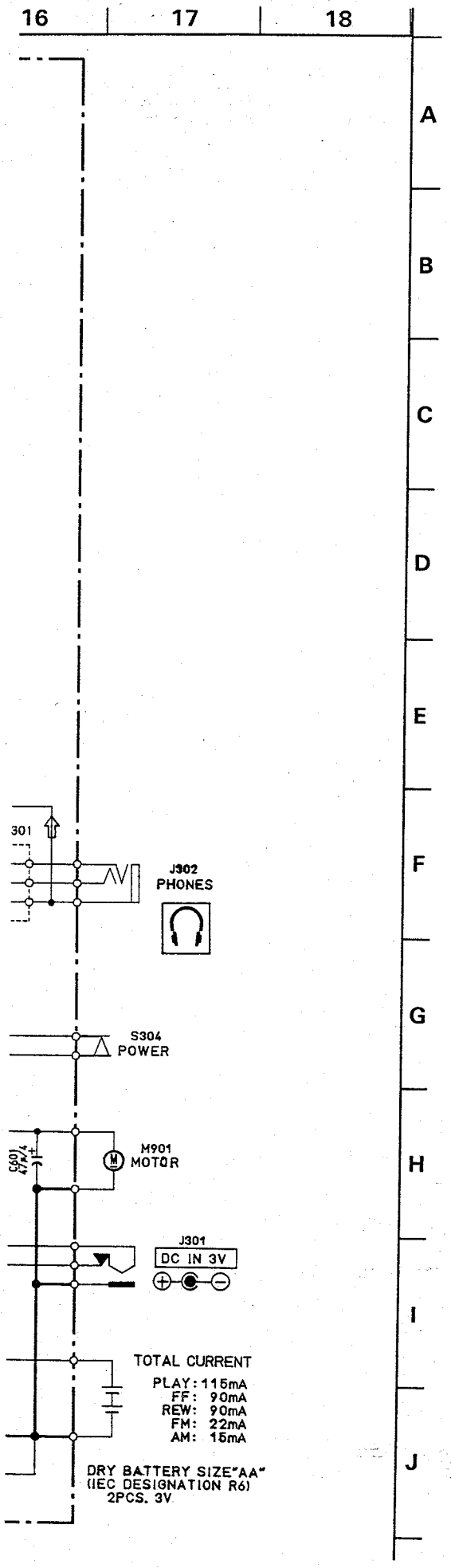
PRINTED WIRING BOARD


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
HP901 PB HEAD
AM FERRITE-ROD ANTENNA L1
S301-1 MODE ST → MONO
S301-2 TAPE NORMAL → METAL
M901 MOTOR
S304 POWER
IC1
IC301
IC302
J302 PHONES
RV301 VOLUME
DRY BATTERY SIZE "AA" (IEC DESIGNATION R6) 2PCS 3V
J301 DC IN 3V
S303 RADIO/TAPE TAPE → RADIO (RADIO OFF)
S302-1 BAND AM ← FM
S302-2 DOLBY OFF ← ON

SCHEMATIC DIAGRAM

【MAIN BOARD】





Note:

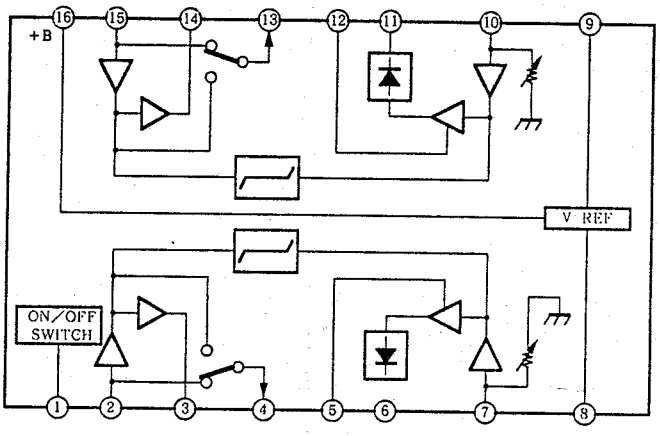
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- △ : internal component.
- ⊣W⊢ : printed resistor.
- Switch

Ref. No.	Switch	Position
S301	MODE/TAPE	ST/NORMAL
S302	BAND/DOLBY	FM/ON
S303	RADIO/TAPE	TAPE
S304	POWER	OFF

- B+ : B+ Line
- Total current is measured with no cassette installed.
- Power voltage is dc 3V and fed with requrated dc power. supply from external power voltage jack.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  RADIO : detuned
  TAPE : in playback mode
  no mark: PLAY
  ( ) : FM
  < > : AM
- Voltages are taken with a VOM (50 kΩ/V). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM ⇨ : PB (DECK A)

IC BLOCK DIAGRAMS

NJM-2063AM



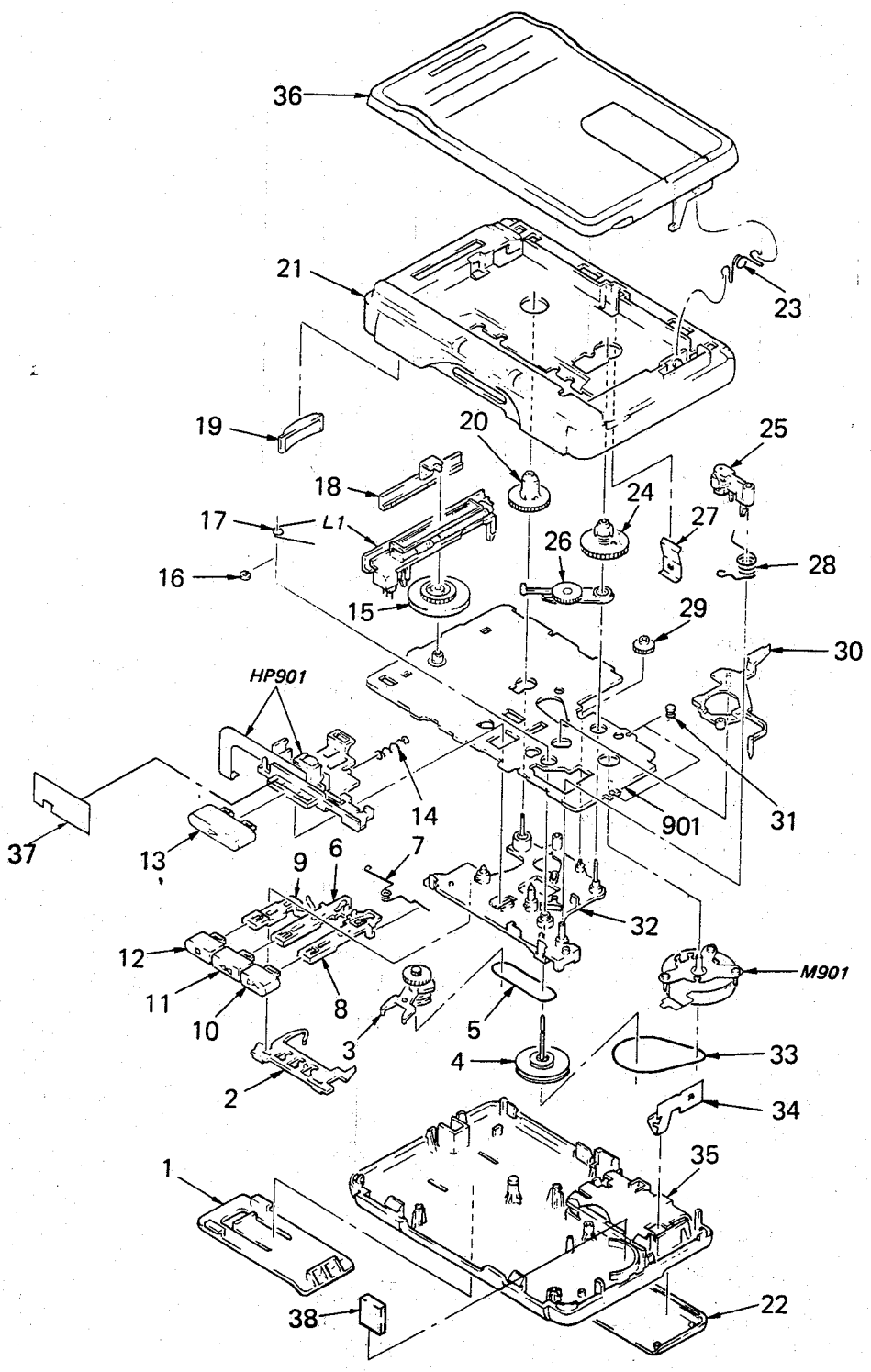
SECTION 4
EXPLODED VIEWS

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1)



No.	Part No.	Description	Remarks
1	3-346-518-01	CLIP, BELT	
2	3-346-522-01	PLATE, LOCK	
3	X-3346-503-1	GEAR ASSY, MIDWAY	
4	X-3346-505-1	WHEEL ASSY, CAPSTAN	
5	3-335-604-01	BELT, MIDWAY	
6	3-346-527-01	LEVER (REW)	
7	3-346-539-01	SPRING (FR)	
8	3-346-526-02	LEVER (FF)	
9	3-346-528-01	LEVER (STOP)	
10	3-346-513-11	BUTTON (FF)	
11	3-346-514-11	BUTTON (REW)	
12	3-346-515-11	BUTTON (STOP)	
13	3-346-512-11	BUTTON (PLAY)	
14	3-335-605-01	SPRING, COMPRESSION	
15	3-346-502-01	KNOB (TU)	
16	3-343-358-01	RING, RETAINING	
17	3-346-538-01	SPRING (GROUND)	
18	3-346-503-01	POINTER	
19	3-346-504-01	COVER, KNOB	
20	3-346-525-01	GEAR (S REEL)	
21	3-346-721-71	CABINET (FRONT) (CF-A2)	
22	3-346-517-01	LID, BATTERY CASE	
23	3-346-509-01	SPRING	
24	X-3346-502-1	TABLE ASSY, T REEL	
25	X-3334-005-1	PINCH ROLLER ASSY	
26	X-3346-504-1	GEAR ASSY, PLAY	
27	3-346-516-01	SPRING	
28	3-335-608-01	SPRING	
29	3-334-089-01	GEAR, FF	
30	3-346-523-01	LEVER (SHUT-OFF)	
31	3-335-652-01	CUSHION (C), MOTOR	
32	X-3346-501-2	BASE ASSY, GUIDE	
33	3-335-603-11	BELT, CAPSTAN	
34	3-334-057-01	TERMINAL BOARD, RELAY	
35	3-346-506-41	CABINET (REAR) (CF-C)	
36	X-3346-559-1	HOLDER ASSY (CF-C), CASSETTE	
37	*3-347-177-01	SPACER (HI)	
38	9-911-841-XX	CUSHION (B), MICROPHONE	
901	A-3015-660-A	PC BOARD ASSY, MAIN	
L1	1-402-361-11	ANTENNA, FERRITE-ROD (AM)	
HP901	A-3108-292-A	PC BOARD ASSY, HEAD	
M901	1-541-572-11	MOTOR, DC	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description		
901	A-3015-660-A	PC BOARD ASSY, MAIN		
C2	1-163-103-00	CERAMIC CHIP 27PF	5%	50V
C3	1-163-104-00	CERAMIC CHIP 30PF	5%	50V
C4	1-163-096-00	CERAMIC CHIP 13PF	5%	50V
C5	1-163-100-00	CERAMIC CHIP 20PF	5%	50V
C6	1-163-129-00	CERAMIC CHIP 330PF	10%	50V
C7	1-162-637-11	CERAMIC CHIP 0.47MF		16V
C8	1-164-157-11	CERAMIC CHIP 0.068MF	10%	25V
C9	1-164-158-11	CERAMIC CHIP 0.082MF	10%	25V
C10	1-164-158-11	CERAMIC CHIP 0.082MF	10%	25V
C11	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C12	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C13	1-124-222-00	ELECT 22MF	20%	6.3V
C14	1-163-078-11	CERAMIC CHIP 0.033MF	10%	25V
C15	1-124-432-00	ELECT 47MF	20%	4V
C16	1-163-986-00	CERAMIC CHIP 0.027MF	10%	25V
C17	1-163-986-00	CERAMIC CHIP 0.027MF	10%	25V
C18	1-162-611-00	CERAMIC CHIP 1MF		25V
C19	1-162-611-00	CERAMIC CHIP 1MF		25V
C20	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C21	1-162-611-00	CERAMIC CHIP 1MF		25V
C22	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C23	1-162-611-00	CERAMIC CHIP 1MF		25V
C101	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C102	1-124-432-00	ELECT 47MF	20%	4V
C103	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C104	1-163-125-00	CERAMIC CHIP 220PF	10%	50V
C105	1-162-611-00	CERAMIC CHIP 1MF		25V
C106	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C107	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C108	1-131-587-11	TANTALUM 0.68MF	10%	35V
C109	1-163-017-00	CERAMIC CHIP 0.0047MF	5%	50V
C110	1-163-989-11	CERAMIC CHIP 0.033MF	5%	25V
C111	1-162-611-00	CERAMIC CHIP 1MF		25V
C112	1-163-053-00	CERAMIC CHIP 0.0033MF	10%	50V
C113	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C114	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C115	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C116	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C201	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C202	1-124-432-00	ELECT 47MF	20%	4V
C203	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C204	1-163-125-00	CERAMIC CHIP 220PF	10%	50V
C205	1-162-611-00	CERAMIC CHIP 1MF		25V
C206	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V
C207	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C208	1-131-587-11	TANTALUM 0.68MF	10%	35V
C209	1-163-017-00	CERAMIC CHIP 0.0047MF	5%	50V
C210	1-163-989-11	CERAMIC CHIP 0.033MF	5%	25V
C211	1-162-611-00	CERAMIC CHIP 1MF		25V
C212	1-163-053-00	CERAMIC CHIP 0.0033MF	10%	50V
C213	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C214	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C215	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C216	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C301	1-124-225-00	ELECT 100MF	20%	6.3V
C302	1-124-434-00	ELECT 220MF	20%	4V
C303	1-124-434-00	ELECT 220MF	20%	4V
C304	1-163-038-00	CERAMIC CHIP 0.1MF		25V
C305	1-124-224-00	ELECT 47MF	20%	6.3V
C306	1-126-157-11	ELECT 10MF	20%	6.3V
C307	1-124-434-00	ELECT 220MF	20%	4V
C308	1-124-434-00	ELECT 220MF	20%	4V
C310	1-163-141-00	CERAMIC CHIP 0.001MF	10%	50V
C311	1-163-205-00	CERAMIC CHIP 0.001MF	10%	50V
C312	1-163-117-00	CERAMIC CHIP 100PF	5%	50V
C601	1-124-432-00	ELECT 47MF	20%	4V
CF1	1-527-870-00	FILTER, CERAMIC (455kHz)		
CF2	1-577-090-71	FILTER, CERAMIC (10.7MHz)		
CP1	1-236-022-11	FILTER, BAND PASS		
D1	8-719-104-22	DIODE 1SS123		
HP901	A-3108-292-A	PC BOARD ASSY, HEAD		
IC1	8-759-230-39	IC TA8122AF		
IC301	8-759-802-85	IC LA4570M		
IC302	8-759-701-07	IC NJM2063AM		
J301	1-565-286-11	JACK, OUTER POWER		
J302	1-565-287-11	JACK (PHONES)		
JR301	1-216-296-00	METAL GLAZE 0	5%	1/8W
JR302	1-216-296-00	METAL GLAZE 0	5%	1/8W
JR303	1-216-296-00	METAL GLAZE 0	5%	1/8W
JR304	1-216-296-00	METAL GLAZE 0	5%	1/8W
JR305	1-216-296-00	METAL GLAZE 0	5%	1/8W
L1	1-402-361-11	ANTENNA, FERRITE-ROD (AM)		
L2	1-459-844-11	COIL (WITH CORE)(FM RF)		
L3	1-459-846-11	COIL (WITH CORE)(FM OSC)		
L4	1-406-281-11	COIL (OSC)(AM)		
L5	1-410-204-31	INDUCTOR CHIP 10UH		
L6	1-410-204-31	INDUCTOR CHIP 10UH		

Ref.No.	Part No.	Description
M901	1-541-572-11	MOTOR, DC
PVC1	1-151-599-11	CAP, VAR, POLYETHYLENE
Q1	8-729-600-27	TRANSISTOR 2SC634-SP7
Q2	8-729-600-27	TRANSISTOR 2SC634-SP7
Q101	8-729-102-62	TRANSISTOR 2SC1623
Q201	8-729-102-62	TRANSISTOR 2SC1623
Q301	8-729-102-62	TRANSISTOR 2SC1623
Q302	8-729-102-62	TRANSISTOR 2SC1623
R1	1-249-433-11	RES,CARBON 22K 5% 1/64W
R2	1-249-429-11	RES,CARBON 10K 10% 1/64W
R3	1-249-429-11	RES,CARBON 10K 10% 1/64W
R4	1-216-001-00	METAL GLAZE 10 5% 1/10W
R101	1-216-058-11	RES,CARBON 2.4K 5% 1/64W
R102	1-216-029-11	RES,CARBON 150 5% 1/64W
R103	1-216-063-11	RES,CARBON 3.9K 5% 1/64W
R104	1-216-101-11	RES,CARBON 150K 5% 1/64W
R105	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R106	1-216-059-11	RES,CARBON 2.7K 10% 1/64W
R107	1-216-112-11	RES,CARBON 430K 5% 1/64W
R108	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R109	1-249-437-11	RES,CARBON 47K 5% 1/64W
R110	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R111	1-249-405-11	RES,CARBON 100 10% 1/64W
R201	1-216-058-11	RES,CARBON 2.4K 5% 1/64W
R202	1-216-029-11	RES,CARBON 150 5% 1/64W
R203	1-216-063-11	RES,CARBON 3.9K 5% 1/64W
R204	1-216-101-11	RES,CARBON 150K 5% 1/64W
R205	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R206	1-216-059-11	RES,CARBON 2.7K 10% 1/64W
R207	1-216-112-11	RES,CARBON 430K 5% 1/64W
R208	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R209	1-249-437-11	RES,CARBON 47K 5% 1/64W
R210	1-216-061-11	RES,CARBON 3.3K 5% 1/64W
R211	1-249-405-11	RES,CARBON 100 10% 1/64W
R301	1-216-154-00	METAL GLAZE 15 5% 1/8W
R303	1-216-097-11	RES,CARBON 100K 10% 1/64W
R304	1-216-091-11	RES,CARBON 56K 10% 1/64W
R305	1-216-097-11	RES,CARBON 100K 10% 1/64W
RV301	1-238-072-11	RES, VAR, CABON 10K/10K (VOLUME)

Ref.No.	Part No.	Description
S301	1-571-478-11	SWITCH, SLIDE (TAPE/MODE)
S302	1-571-478-11	SWITCH, SLIDE (DOLBY/BAND)
S303	1-571-478-11	SWITCH, SLIDE (RADIO/TAPE)
S304	1-570-549-11	SWITCH, LEAF (POWER)
T1	1-404-791-11	TRANSFORMER, IF
T301	1-409-444-11	COIL, TRAP
W301	*1-565-288-11	HOUSING, CONNECTOR 3P
W302	*1-565-285-11	HOUSING, CONNECTOR (PC BAORD) 3P
X1	1-577-091-11	OSCILLATOR, CRYSTAL (19kHz)
X2	1-577-090-71	FILTER, CERAMIC (10.7MHz)

ACCESSORY & PACKING MATERIAL

*3-346-549-01	CUSHION (UPPER)
*3-346-558-01	CUSHION (LOWER)
*3-347-164-01	INDIVIDUAL CARTON
3-786-015-41	MANUAL, INSTRUCTION
8-952-313-90	HEADPHONE MDR-005L/B SET